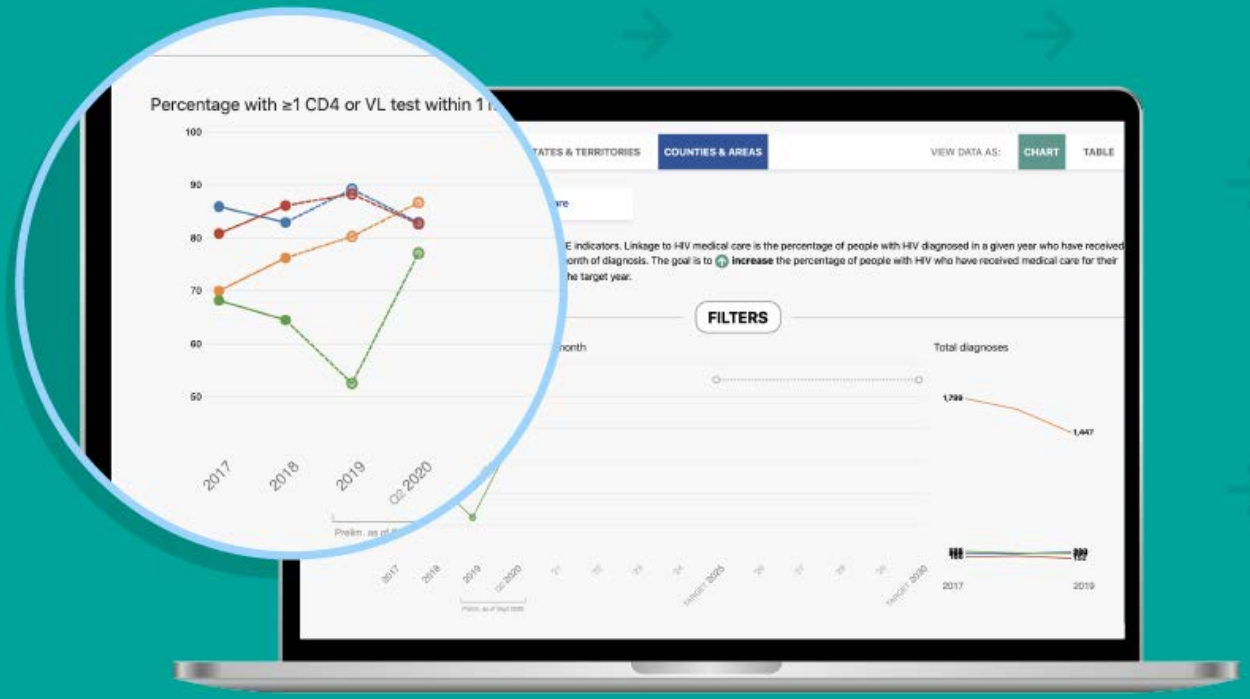
AHEAD

America's HIV Epidemic Analysis Dashboard

USER GUIDE

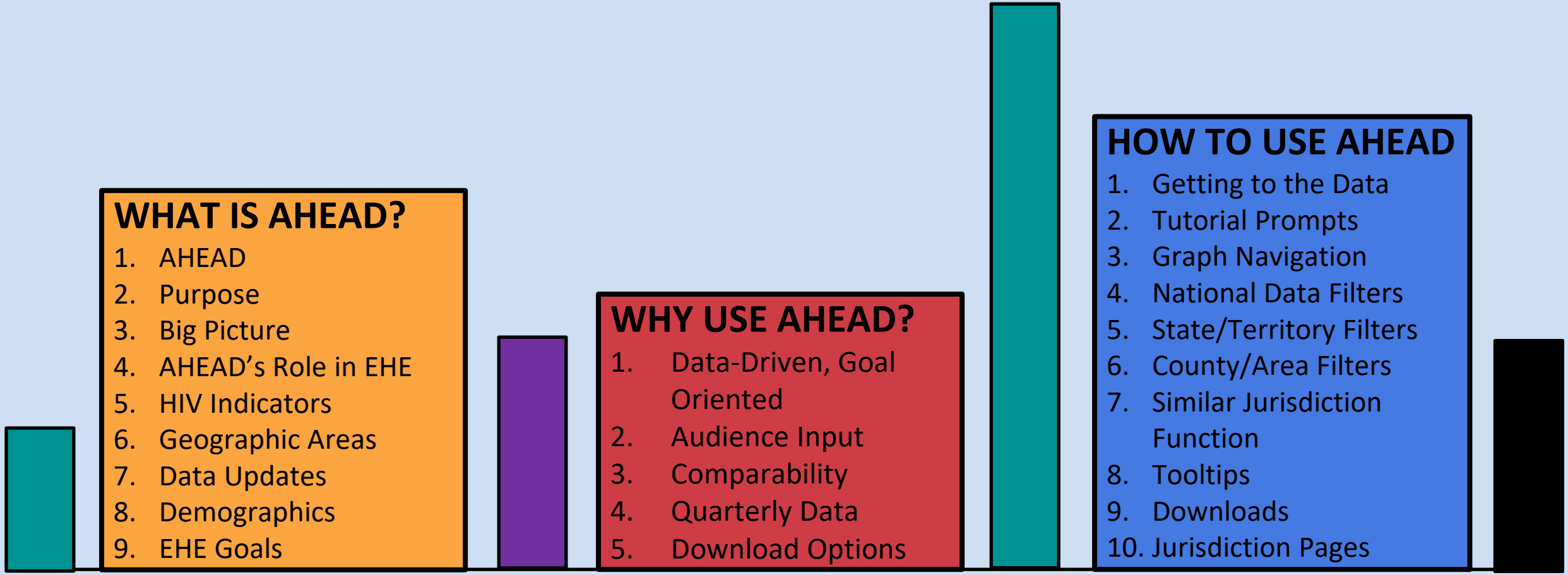


Ending the HIV Epidemic

AHEAD

America's HIV Epidemic Analysis Dashboard

TABLE OF CONTENTS



WHAT IS AHEAD?

1. AHEAD
2. Purpose
3. Big Picture
4. AHEAD's Role in EHE
5. HIV Indicators
6. Geographic Areas
7. Data Updates
8. Demographics
9. EHE Goals

WHY USE AHEAD?

1. Data-Driven, Goal Oriented
2. Audience Input
3. Comparability
4. Quarterly Data
5. Download Options

HOW TO USE AHEAD

1. Getting to the Data
2. Tutorial Prompts
3. Graph Navigation
4. National Data Filters
5. State/Territory Filters
6. County/Area Filters
7. Similar Jurisdiction Function
8. Tooltips
9. Downloads
10. Jurisdiction Pages

AHEAD

America's HIV Epidemic Analysis Dashboard

WHAT IS AHEAD?

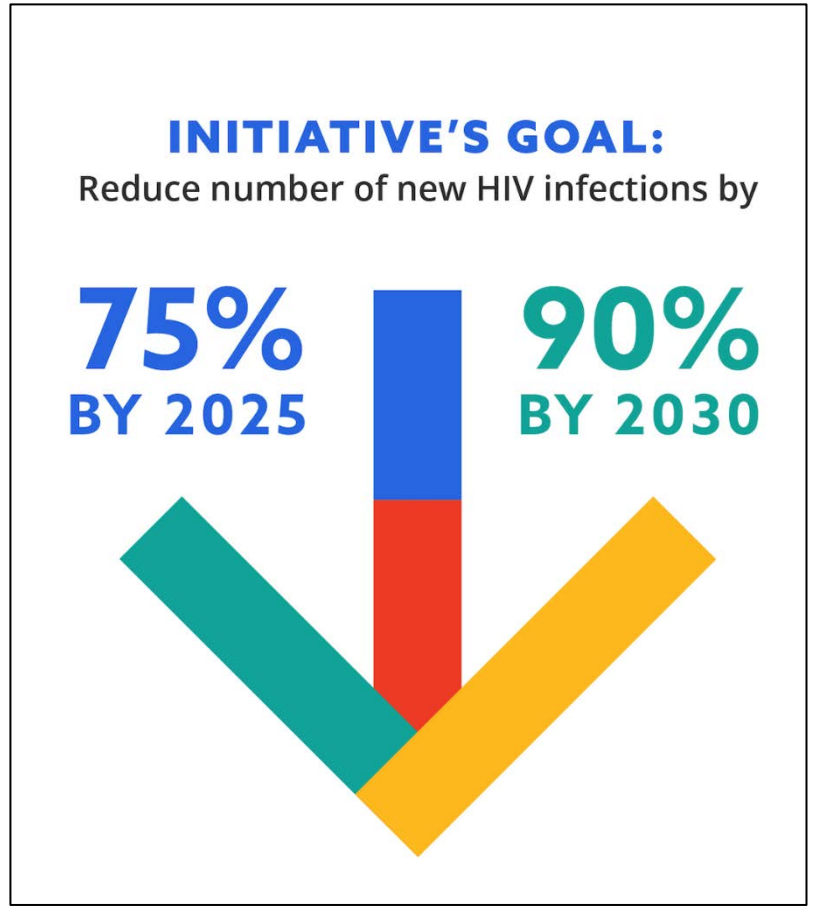
Ending the HIV Epidemic In the U.S.

The *Ending the HIV Epidemic in the U.S.* (EHE) initiative is an operational plan of the U.S. Department of Health and Human Services to end the HIV epidemic in America **by 2030.**

The initiative empowers **local communities** to work together and with the federal government to end the HIV epidemic in America.

The first phase of the initiative will focus on:

- **48 counties, Washington, DC, and San Juan, Puerto Rico**, where more than **50 percent of HIV diagnoses** occurred in 2016 and 2017, and an additional **seven states** with a **substantial number of HIV diagnoses in rural areas**, bringing the total number of Phase I jurisdictions to 57.



Catalyzing the EHE Mission

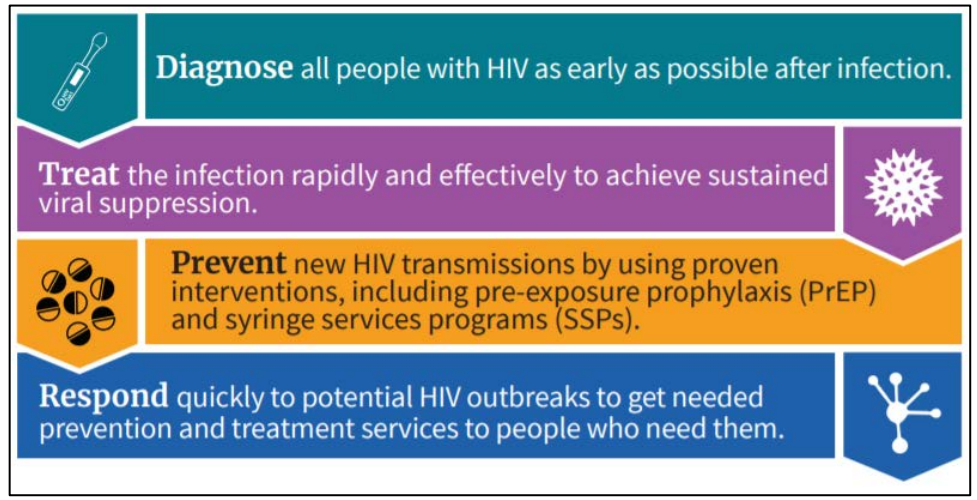
- The federal government introduced two programs that will advance the work towards the goal of ending the HIV epidemic in America.

AHEAD
America's HIV Epidemic Analysis Dashboard

READY SET PrEP

- AHEAD data promotes efforts to understand the communities living with HIV and those at risk.

- By focusing efforts on data transparency and progress, AHEAD empowers local stakeholders to both track movement towards the goals of the EHE and focus additional expertise, technology, and resources required to tailor and implement strategies needed to end the HIV epidemic in their communities.

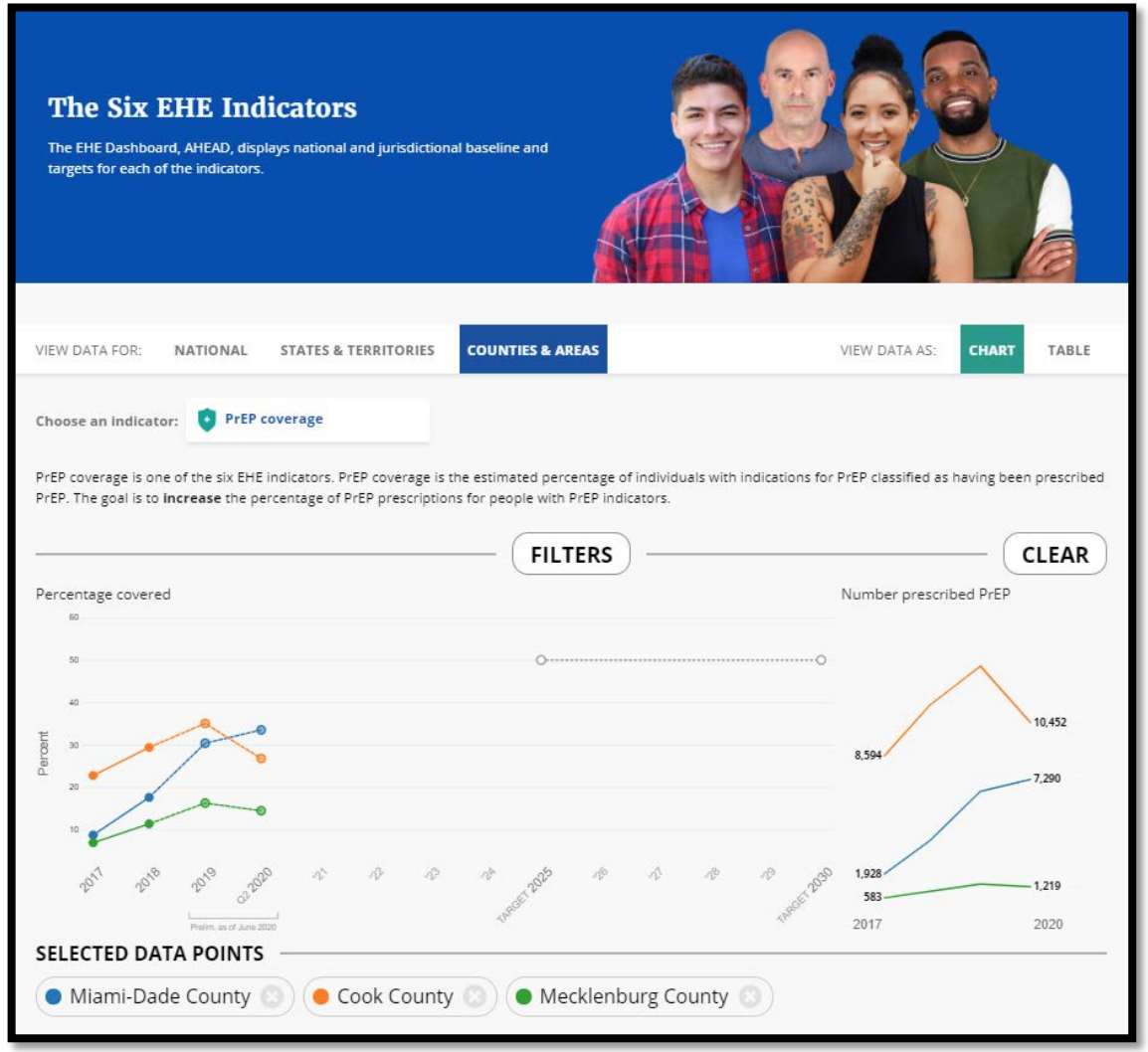


What is AHEAD?

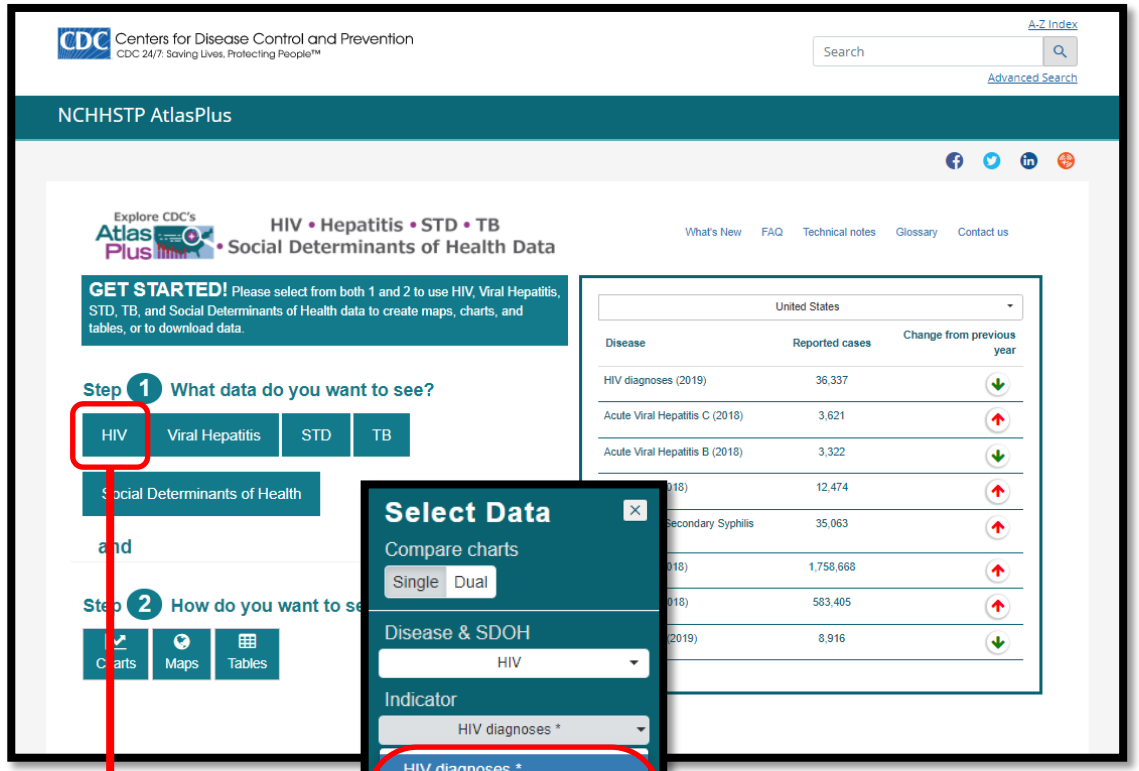
America's HIV Epidemic Analysis Dashboard

is a **resource** for EHE priority areas, communities, and other stakeholders to **monitor progress** towards ending the HIV epidemic locally, **effectively coordinating responses**, and **collectively reducing the number of new HIV transmissions** by 90% by 2030.

- **Standardizes the six indicators** for Ending the HIV Epidemic initiative
- **Displays the most up-to-date CDC data,** with quarterly and yearly updates
- **Tracks progress towards official EHE goals,** at 3 geographic levels



What is the Purpose of AHEAD?



To make it easy for EHE jurisdictions and other EHE stakeholders to

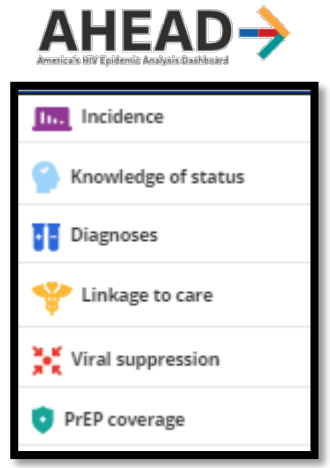
find, examine, and use

a specific subset of

existing CDC data

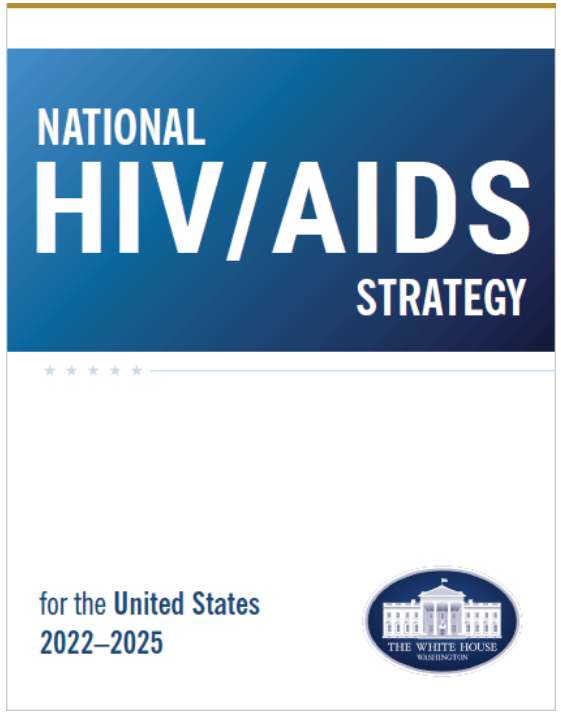
related to EHE for the sole purpose of

helping us understand if we are progressing towards our EHE goals.



How does AHEAD fit into the Big Picture?

The National HIV/AIDS Strategy (2022-2025) is a **government-wide roadmap** addressing how to reduce the HIV epidemic.



- Broader focus across federal departments and agencies beyond HHS
- Covers the entire country and affects all sectors of society
- 4-year timeframe

EHE is an **HHS operational plan** to reduce HIV incidence by 90% by 2030.

Ending the HIV Epidemic
A PLAN FOR AMERICA

- Collaboration between HHS and local, state, federal, and community partners to achieve a common goal.
- Focuses on EHE priority areas
- 10-year timeframe

AHEAD and Ready, Set, PrEP are the two large-scale **EHE components working to achieve the EHE mission.**

AHEAD
America's HIV Epidemic Analysis Dashboard

READY SET PrEP

What is AHEAD's Role within EHE?

Map EHE operational strategies with measurable EHE indicators:

EHE Operational Strategies

Diagnose

Diagnose all people with HIV as early as possible after infection.

Treat

Treat the infection rapidly and effectively to achieve sustained viral suppression.

Prevent

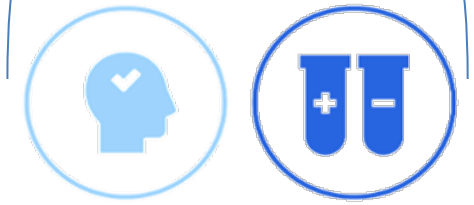
Prevent new HIV transmissions by using proven interventions, including PrEP and syringe services programs (SSPs).

Respond

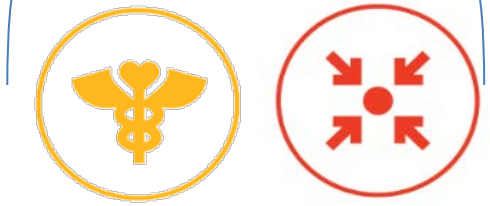
Respond quickly to potential HIV outbreaks to get prevention and treatment services to people who need them.

EHE Indicators

INCIDENCE



KNOWLEDGE OF STATUS **DIAGNOSES**

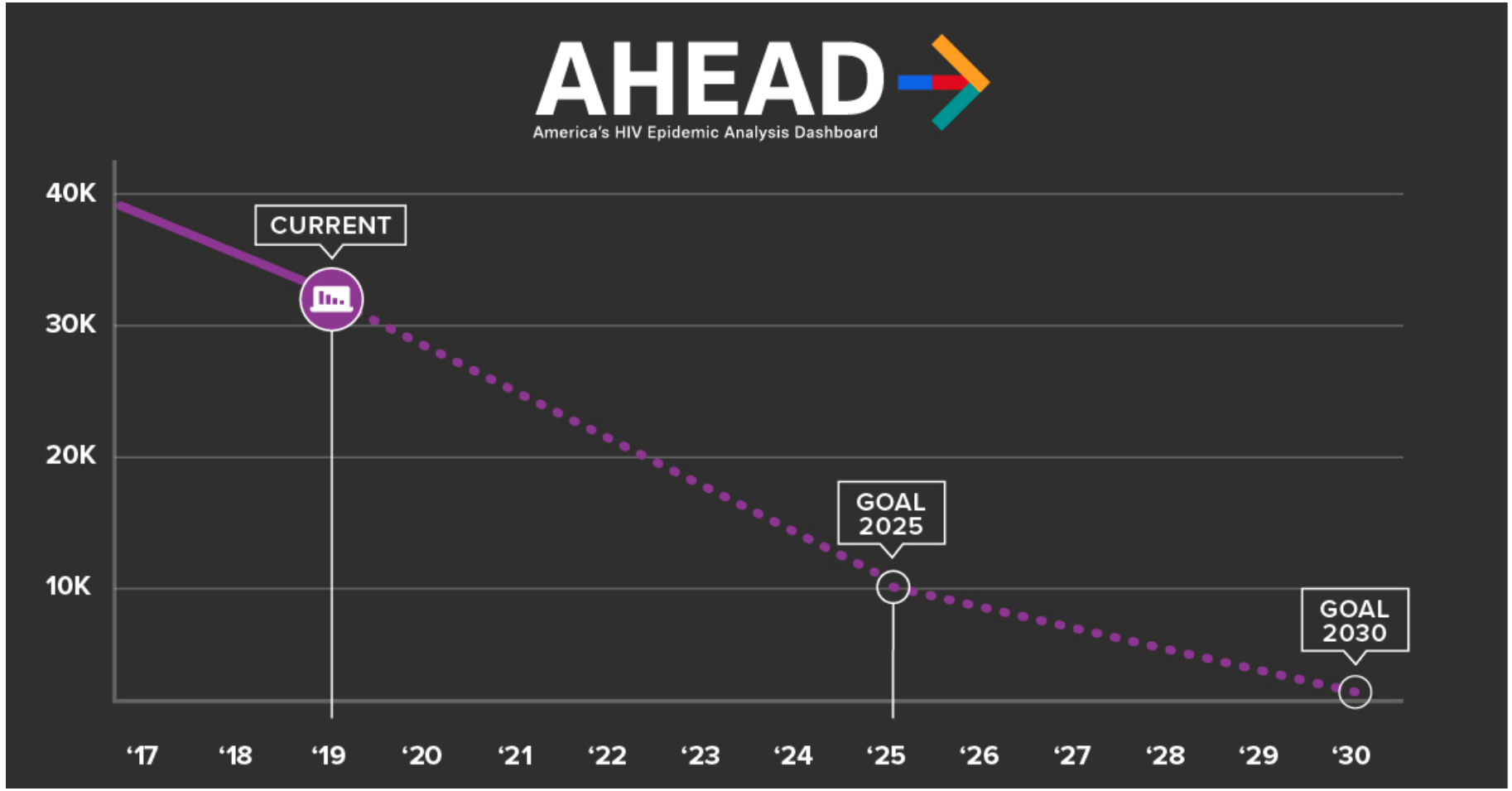


LINKAGE TO HIV MEDICAL CARE **VIRAL SUPPRESSION**

PrEP COVERAGE

What is AHEAD's Role within EHE?

Track progress towards reducing new HIV infections in the United States by 75% by 2025 and 90% by 2030.



Which HIV Indicators are Tracked?

The 6 EHE indicators were chosen with specific public health goals in mind.

Incidence

This indicator measures our overarching goal of reducing new transmissions by 90% by 2030.

Knowledge of Status

Diagnoses

Linkage to HIV Medical Care

These 3 indicators are key to identifying how many people need to be linked to care and represent important steps on the HIV Care Continuum. Data have shown that, upon diagnosis, immediate linkage to care and treatment results in improved HIV outcomes, so it is important to track how these indicators change over time.

Viral Suppression

PrEP Coverage

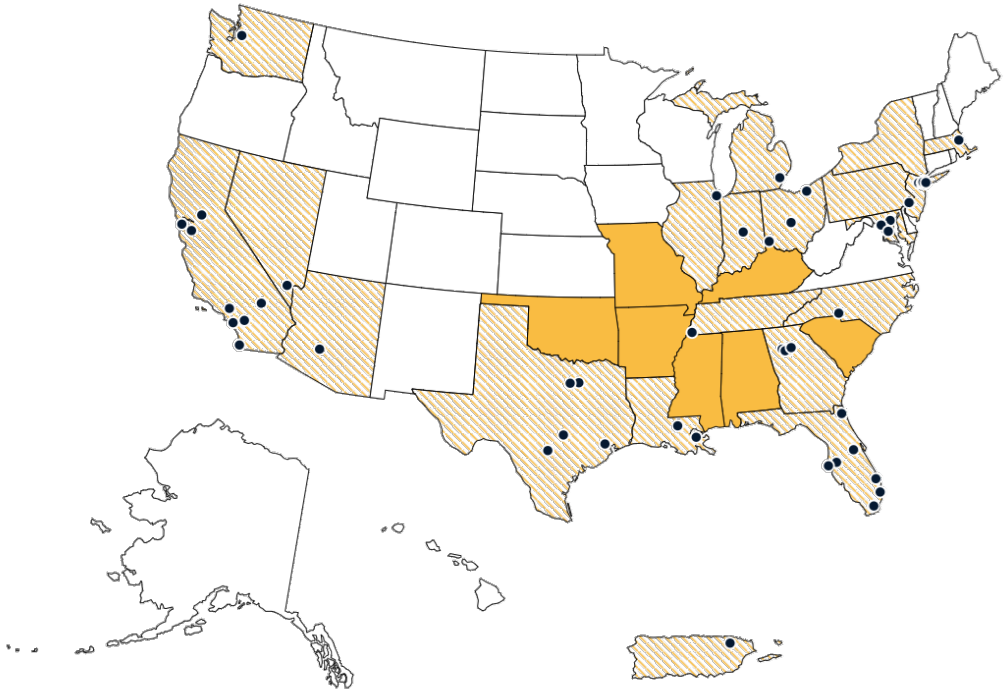
These 2 indicators will have the greatest impact on reducing new transmissions if they are scaled up.

What Geographic Areas are on AHEAD?

County Data
for EHE priority areas

State Data
for all 50 U.S. states
Washington, DC
Puerto Rico

National data

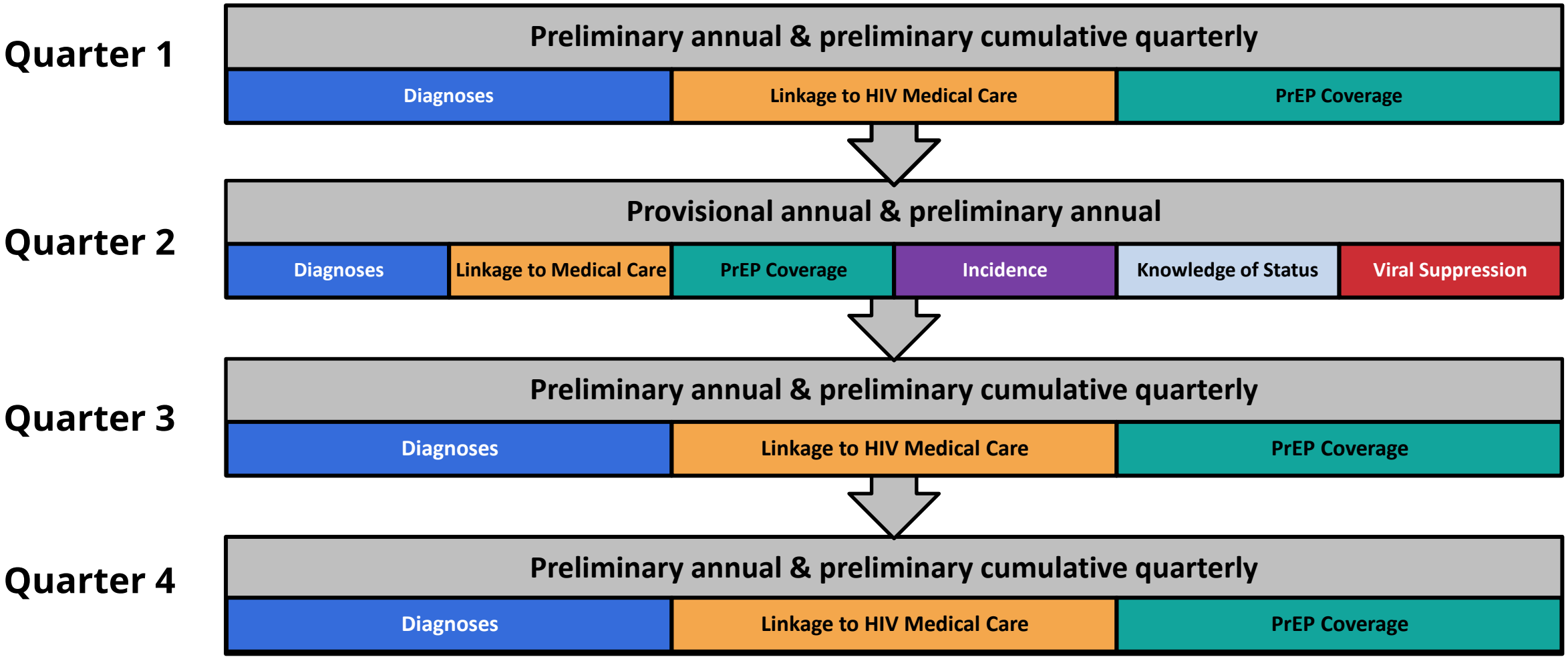


EHE Priority Areas

Alabama
Arizona*
Maricopa County
Arkansas
California*
Alameda County
Los Angeles County
Orange County
Riverside County
Sacramento County
San Diego County
San Francisco County
District of Columbia
Florida*
Broward County
Duval County
Hillsborough County
Miami-Dade County
Orange County
Palm Beach County
Pinellas County
Georgia*
Cobb County
Dekalb County
Fulton County
Gwinnett County
Illinois*
Cook County
Indiana*
Marion County
Kentucky
Louisiana*
East Baton Rouge Parish
Orleans Parish
Maryland*
Baltimore City
Montgomery County
Prince George's County
Massachusetts*
Suffolk County
Michigan*
Wayne County
Mississippi
Missouri
Nevada*
Clark County
New Jersey*
Essex County
Hudson County
New York*
Bronx County
Kings County
New York County
Queens County
North Carolina*
Mecklenburg County
Ohio*
Cuyahoga County
Franklin County
Hamilton County
Oklahoma
Pennsylvania*
Philadelphia County
Puerto Rico*
San Juan Municipio
South Carolina
Tennessee*
Shelby County
Texas*
Bexar County
Dallas County
Harris County
Tarrant County
Travis County
Washington*
King County

**Non-priority state with EHE priority county*

How Often are the Data Updated?



What Demographics are Available?

At the national level, the following data categories are available:

INCIDENCE

- **Age**
  - 13-24
  - 25-34
  - 35-44
  - 45-54
  - Over 55
- **Race/Ethnicity**
  - American Indian/Alaska Native
  - Asian
  - Black/African American
  - Hispanic/Latinx
  - Multiple races
  - Native Hawaiian/Other Pacific Islander
  - White
- **Sex at birth**
  - Female
  - Male
- **Transmission Category**
  - Heterosexual contact (female)
  - Heterosexual contact (male)
  - Injection drug use (female)
  - Injection drug use (male)
  - Male-to-male sexual contact
  - Male-to-male sexual contact and injection drug use

KNOWLEDGE OF STATUS

- **Age**
  - 13-24
  - 25-34
  - 35-44
  - 45-54
  - Over 55
- **Race/Ethnicity**
  - American Indian/Alaska Native
  - Asian
  - Black/African American
  - Hispanic/Latinx
  - Multiple races
  - Native Hawaiian/Other Pacific Islander
  - White
- **Sex at birth**
  - Female
  - Male
- **Transmission Category**
  - Heterosexual contact (female)
  - Heterosexual contact (male)
  - Injection drug use (female)
  - Injection drug use (male)
  - Male-to-male sexual contact
  - Male-to-male sexual contact and injection drug use

DIAGNOSES

- **Age**
  - 13-24
  - 25-34
  - 35-44
  - 45-54
  - Over 55
- **Race/Ethnicity**
  - American Indian/Alaska Native
  - Asian
  - Black/African American
  - Hispanic/Latinx
  - Multiple races
  - Native Hawaiian/Other Pacific Islander
  - White
- **Gender**
  - Additional gender identity
  - Female (gender)
  - Male (gender)
  - Transgender female-to-male
  - Transgender male-to-female
- **Transmission Category**
  - Heterosexual contact (female)
  - Heterosexual contact (male)
  - Injection drug use (female)
  - Injection drug use (male)
  - Male-to-male sexual contact
  - Male-to-male sexual contact and injection drug use
  - Other (female)
  - Other (male)

LINKAGE TO HIV MEDICAL CARE

VIRAL SUPPRESSION

PrEP COVERAGE

- **Age**
  - 16-24
  - 25-34
  - 35-44
  - 45-54
  - Over 55
- **Race/Ethnicity**
  - Asian/other (PrEP only)
  - Black/African American
  - Hispanic/Latinx
  - White
- **Sex at birth**
  - Female
  - Male

What are the EHE Goals?

	By 2030...	National	State/Territory/County/Area
Incidence	By 90%	3,000 people	Numeric goal is specific to the jurisdiction
Diagnoses	By 90%	3,000 people	Numeric goal is specific to the jurisdiction
Knowledge of Status	To 95%	95%	95%
Linkage to HIV Medical Care	To 95%	95%	95%
Viral Suppression	To 95%	95%	95%
PrEP Coverage	To 50%	50%	50%

AHEAD

America's HIV Epidemic Analysis Dashboard

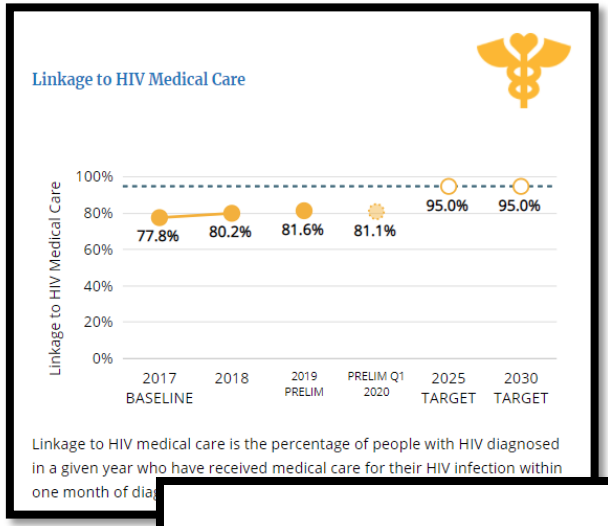
Why Use AHEAD?

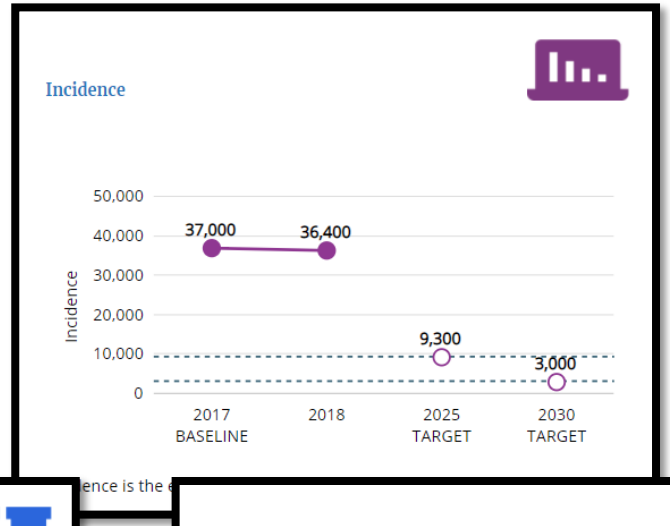
Data-Driven & Goal Oriented

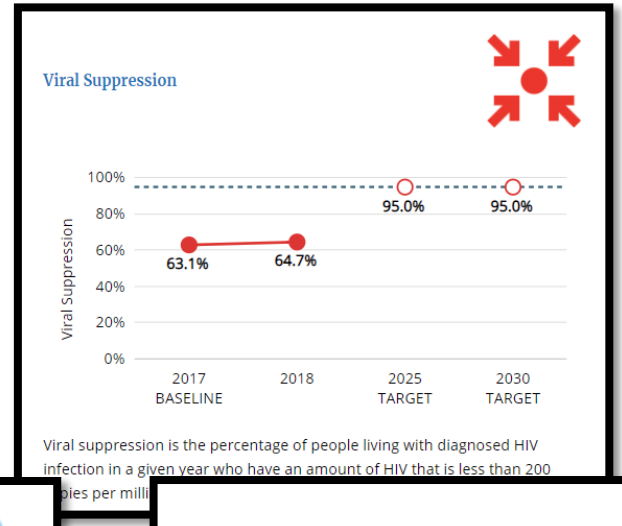
Ending the HIV Epidemic
A PLAN FOR AMERICA

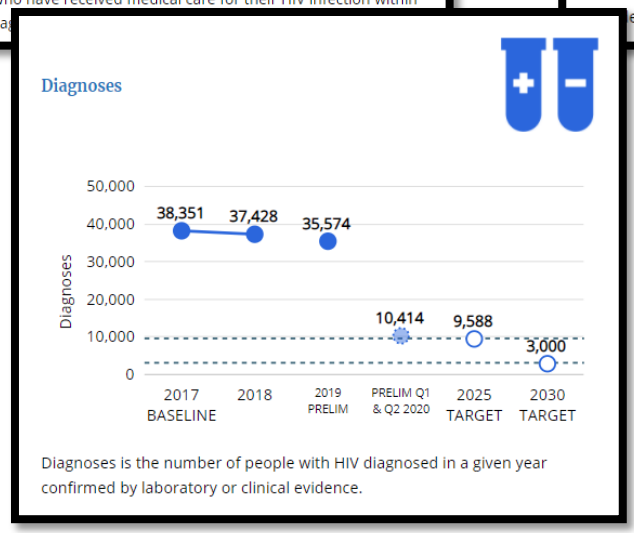
AHEAD
America's HIV Epidemic Analysis Dashboard

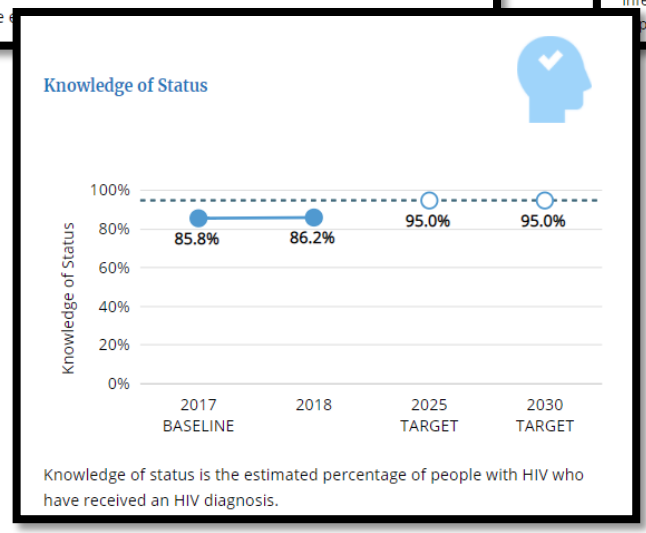
AHEAD is a data-driven effort and the only HIV dashboard to compare progress and official EHE goals

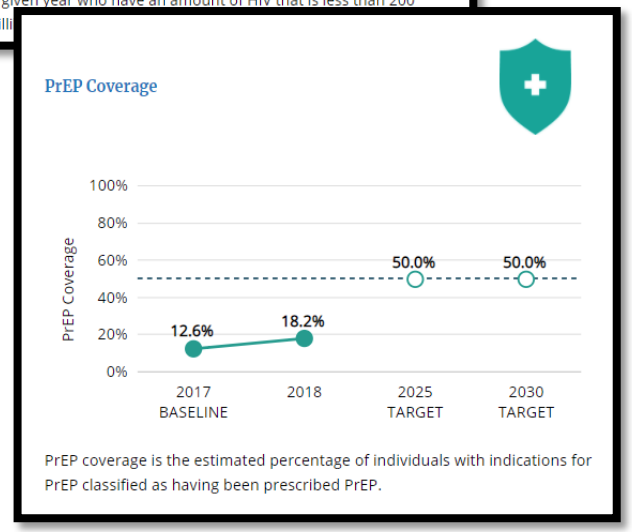












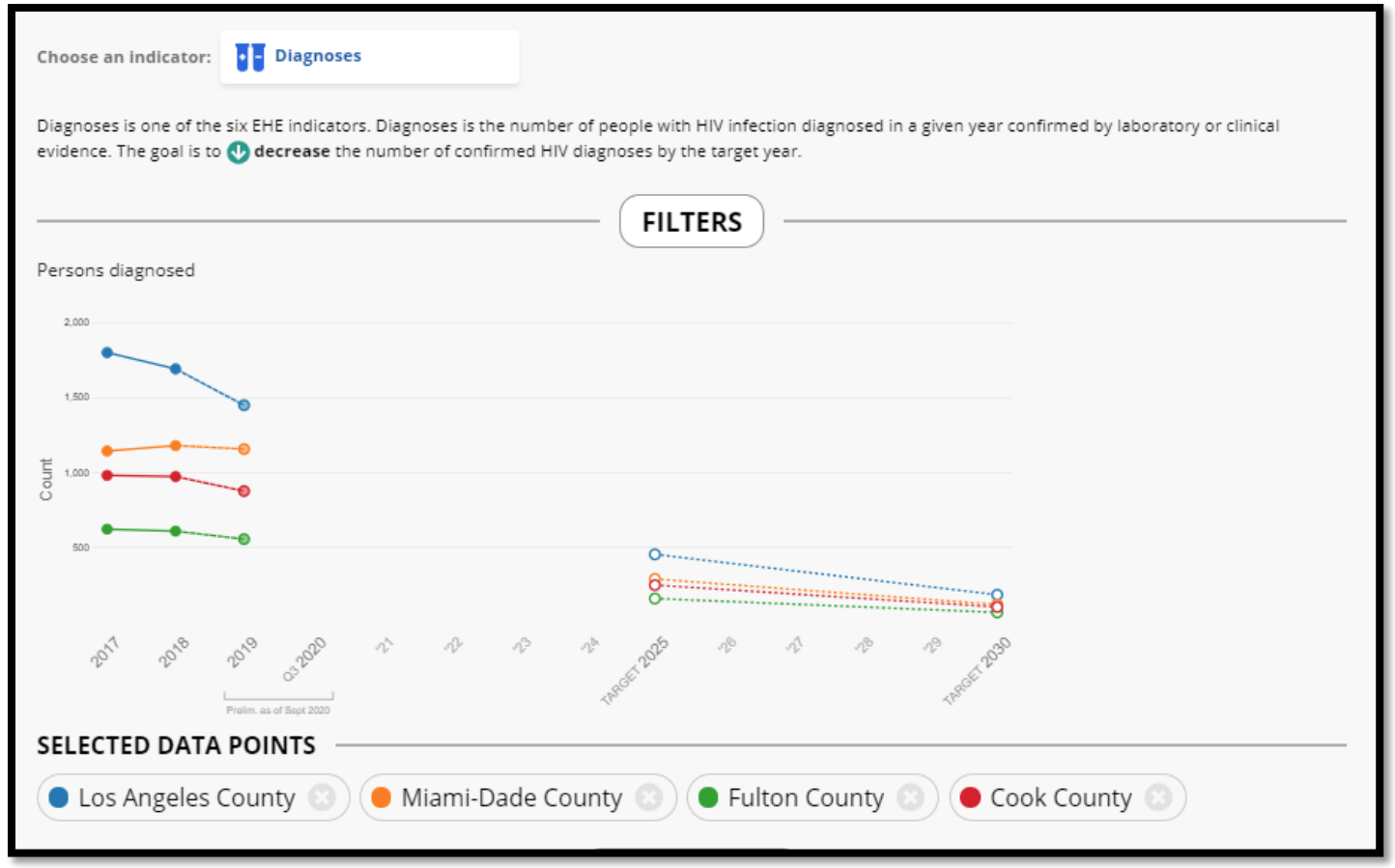
Based on Feedback from Audience Input

Since August 2019, feedback has been collected from major stakeholder groups to provide input on what data and features would be most helpful to make progress towards ending the HIV epidemic in America.

Jurisdictional Comparisons

Standardized Data for Comparisons

- **Standardized CDC data**– allows users to customize and compare multiple jurisdictions (even from different states) on the same graph
- **Suggestions of similar jurisdictions based on EHE progress**– Machine learning that helps users identify jurisdictions that are making similar progress across all 6 indicators



New Data Quarterly

New Data

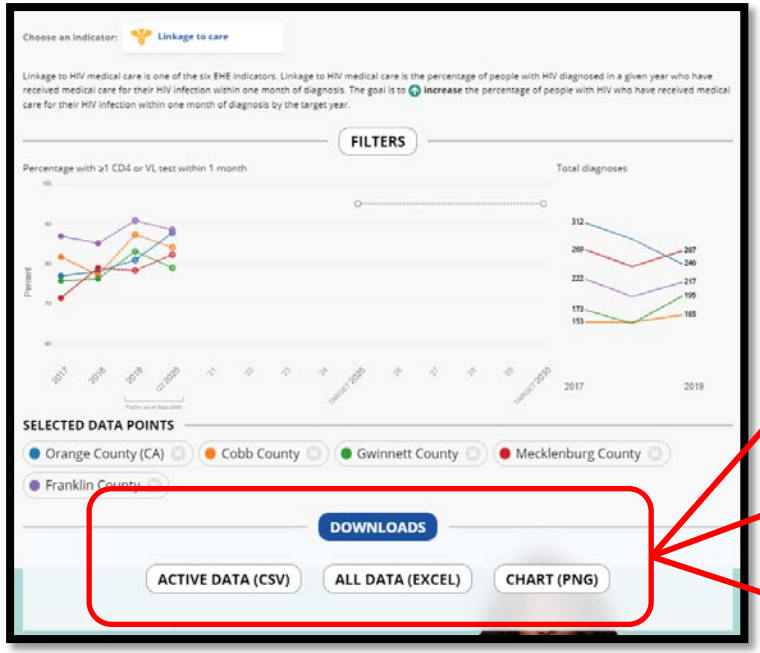
- Data updated on a quarterly basis for diagnoses, linkage to care, and PrEP coverage

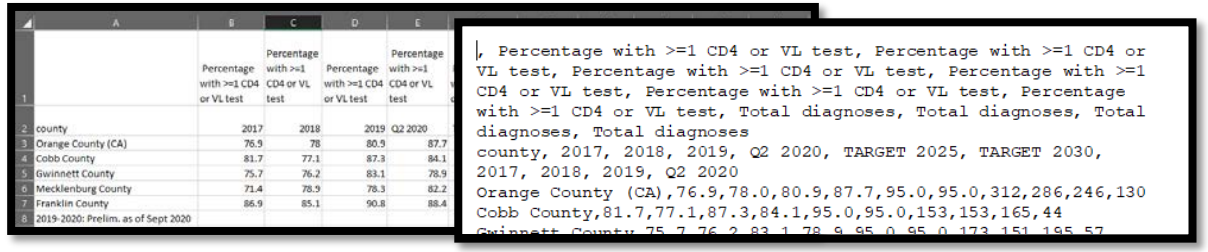
Added Context

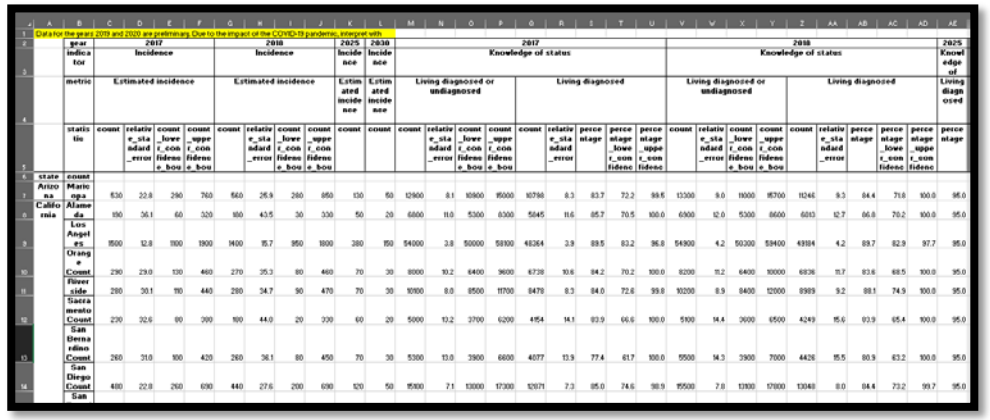
- Side-by-side data of related indicators for the same time period

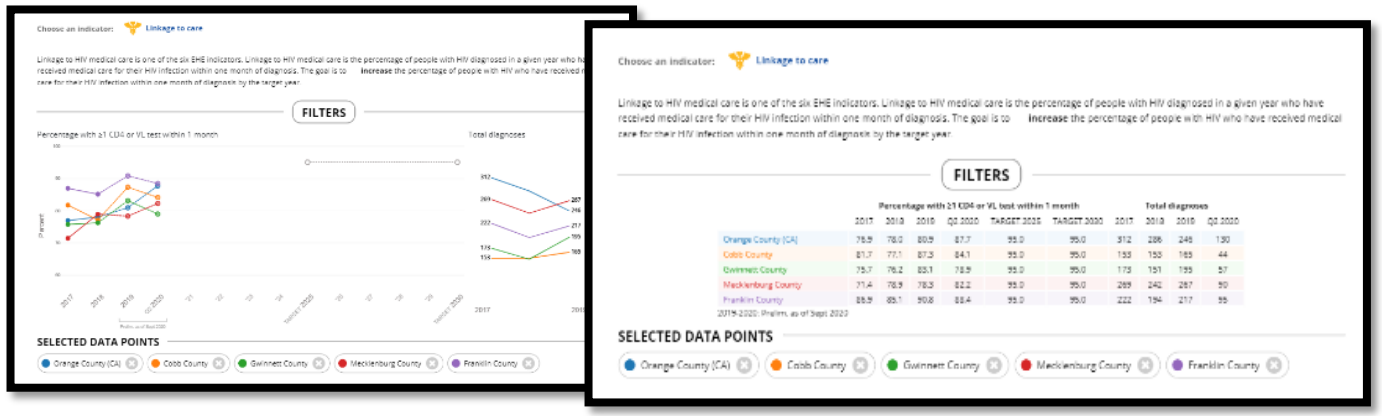
Multiple Download Options

Tailor data downloads, including graphs and selected data points to use in plans, presentations, and reports.









User-selected data downloads available in CSV, Excel, and graph image (PNG).

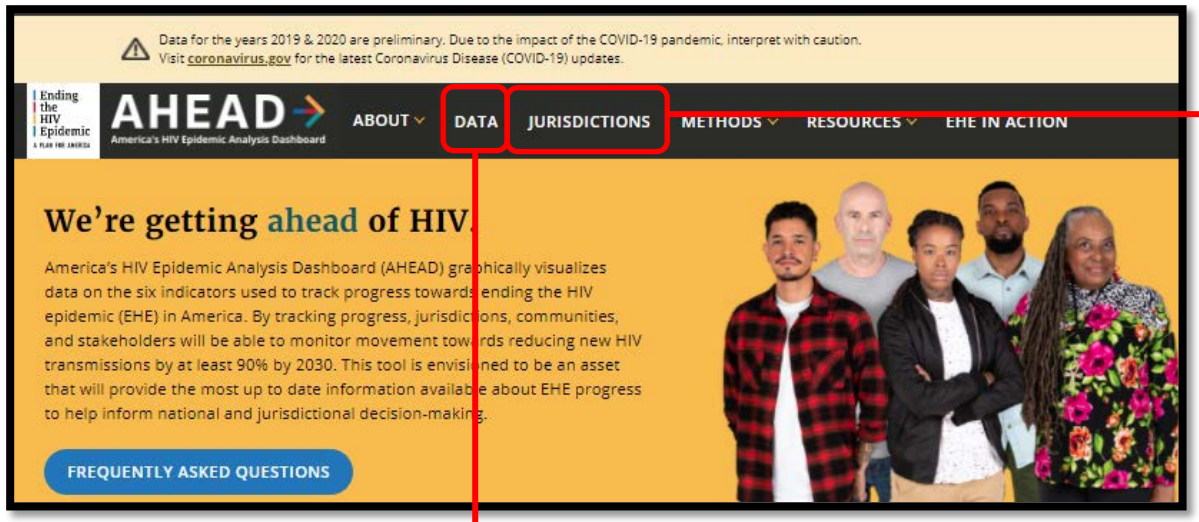
AHEAD

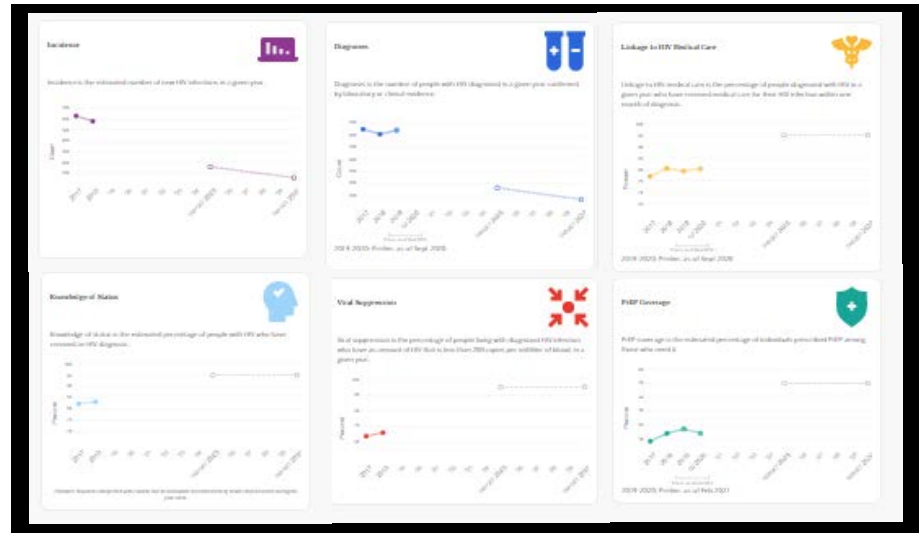
America's HIV Epidemic Analysis Dashboard

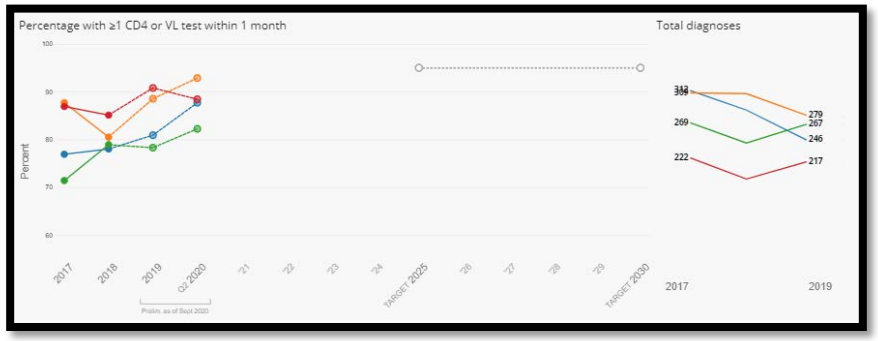
How to Use AHEAD

Getting to the Data

Data are housed in two places on AHEAD:





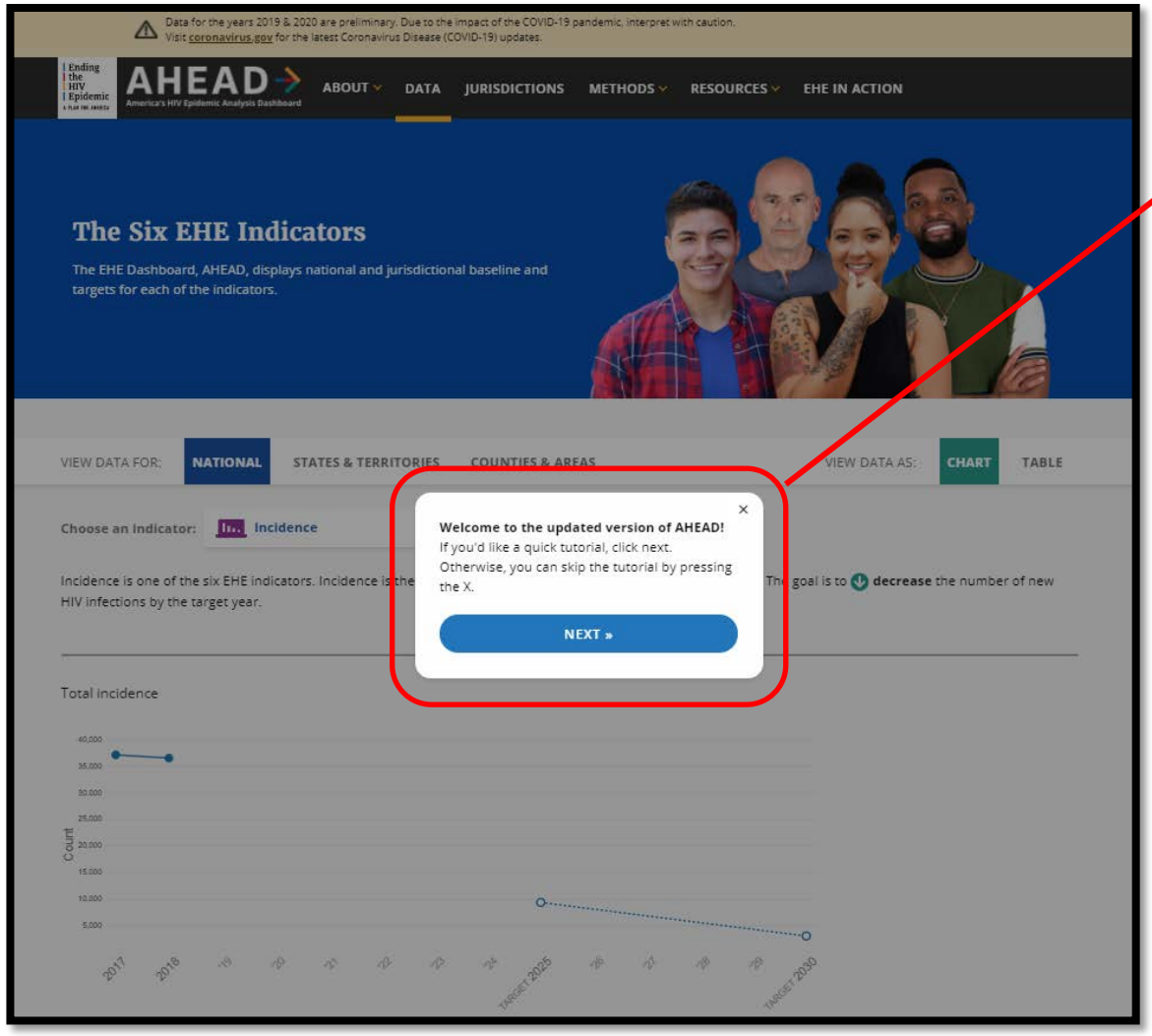


1. ***Data*** page
   - Displays interactive graphs
   - Best used for comparisons
   - Only 1 indicator can be viewed at a time

2. ***Jurisdictions*** pages
   - Displays all 6 indicators for the selected jurisdiction
   - Best for a high level overview of one location
   - Only 1 location can be viewed at a time

Tutorial Prompts

The *Data* Page



Upon first visit to the *Data* page, a pop-up will appear to provide a quick walk-through on how to interact with the graph.

Graph Navigation

These selections will change what filters are available:

Switch between national, state, and local levels

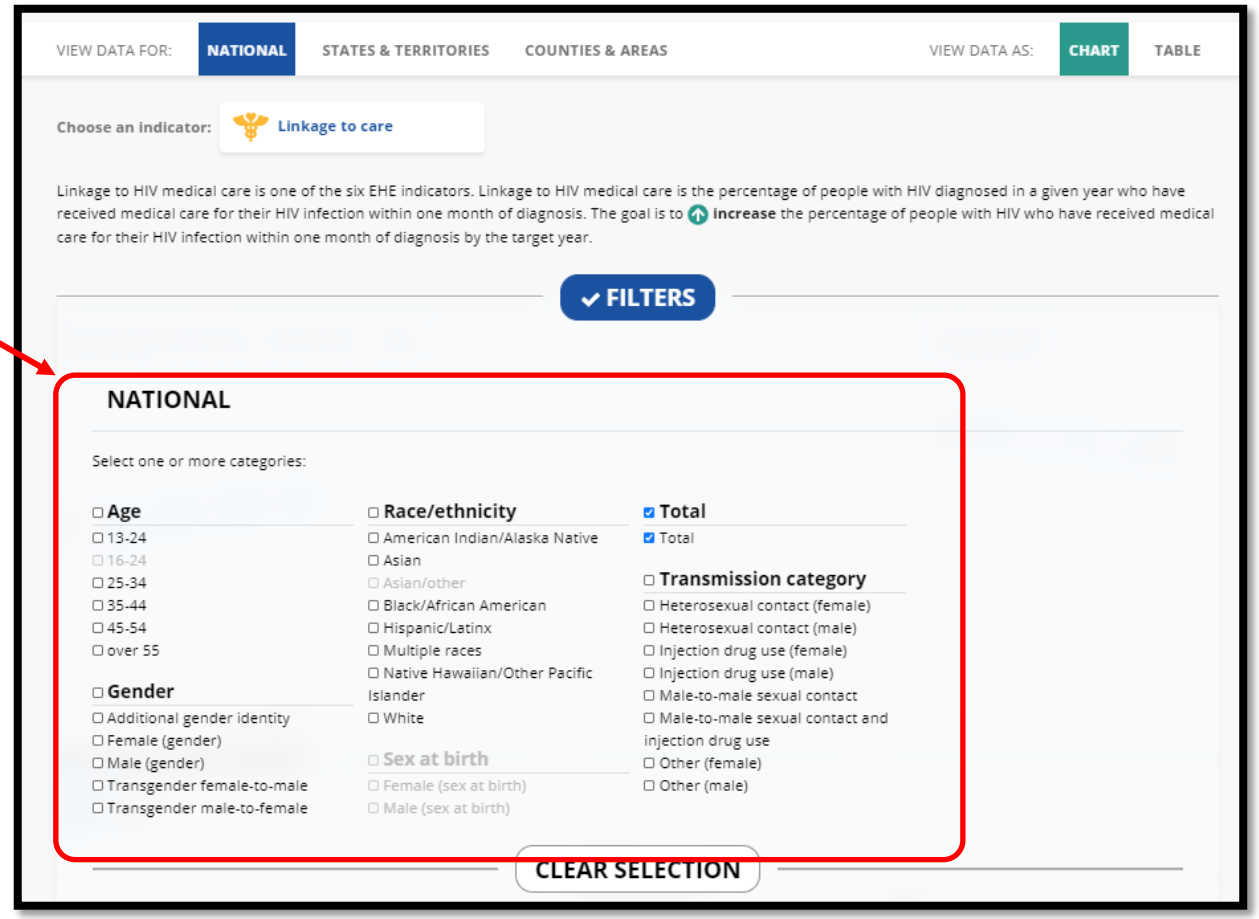
View the data graphically or in table format

Switch between the 6 EHE indicators

National Data Filters

At the national level, users can filter by categories such as age, gender/sex, race/ethnicity, and transmission category.

The default is to show total, or overall, national data.

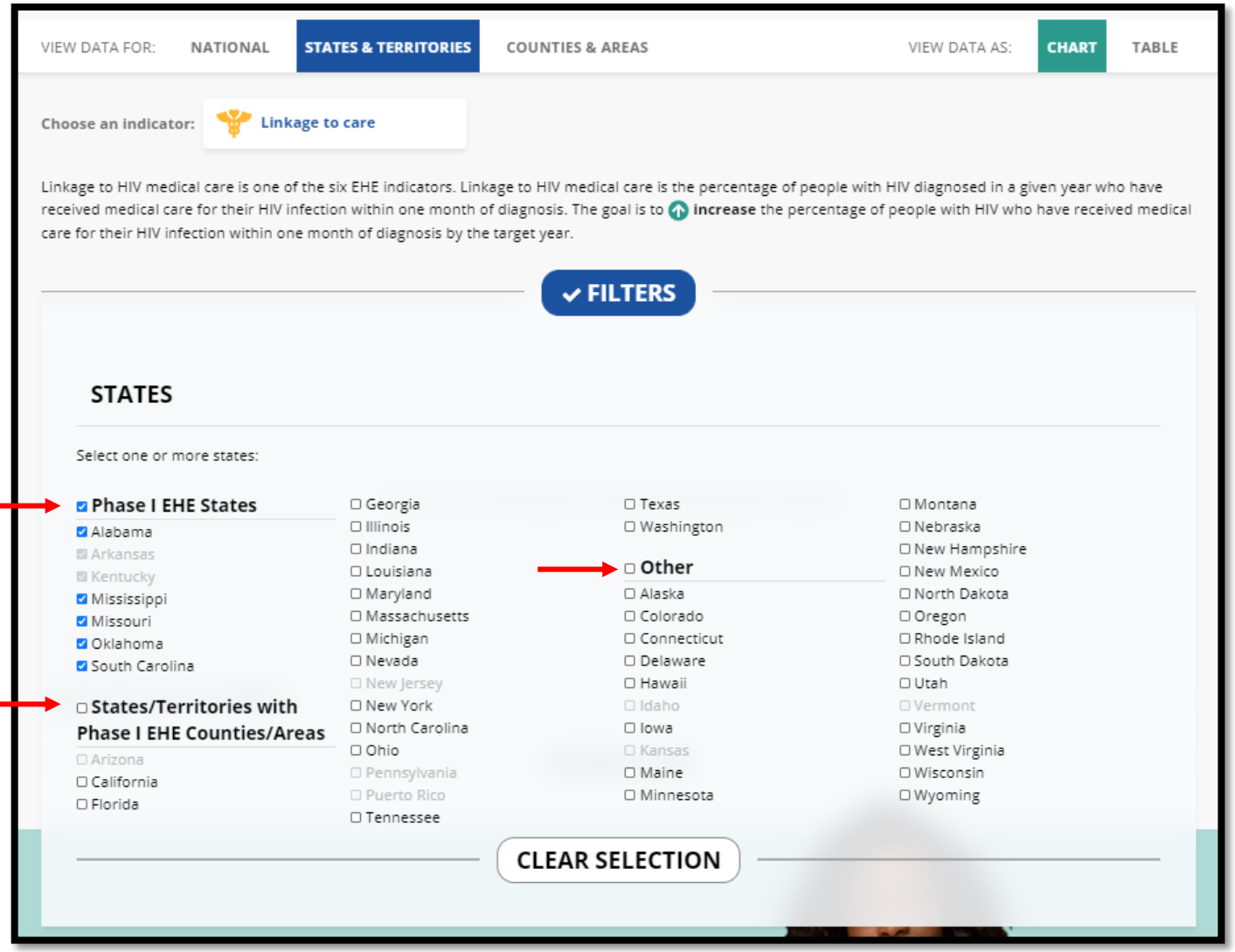


State/Territory Data Filters

EHE Priority state, States with EHE Counties, and Other states can be compared on the same graph.

By selecting the whole group (such as “Phase I EHE States”), all states within that group will be auto-selected for comparison.

Select “Filters” to see the graph.

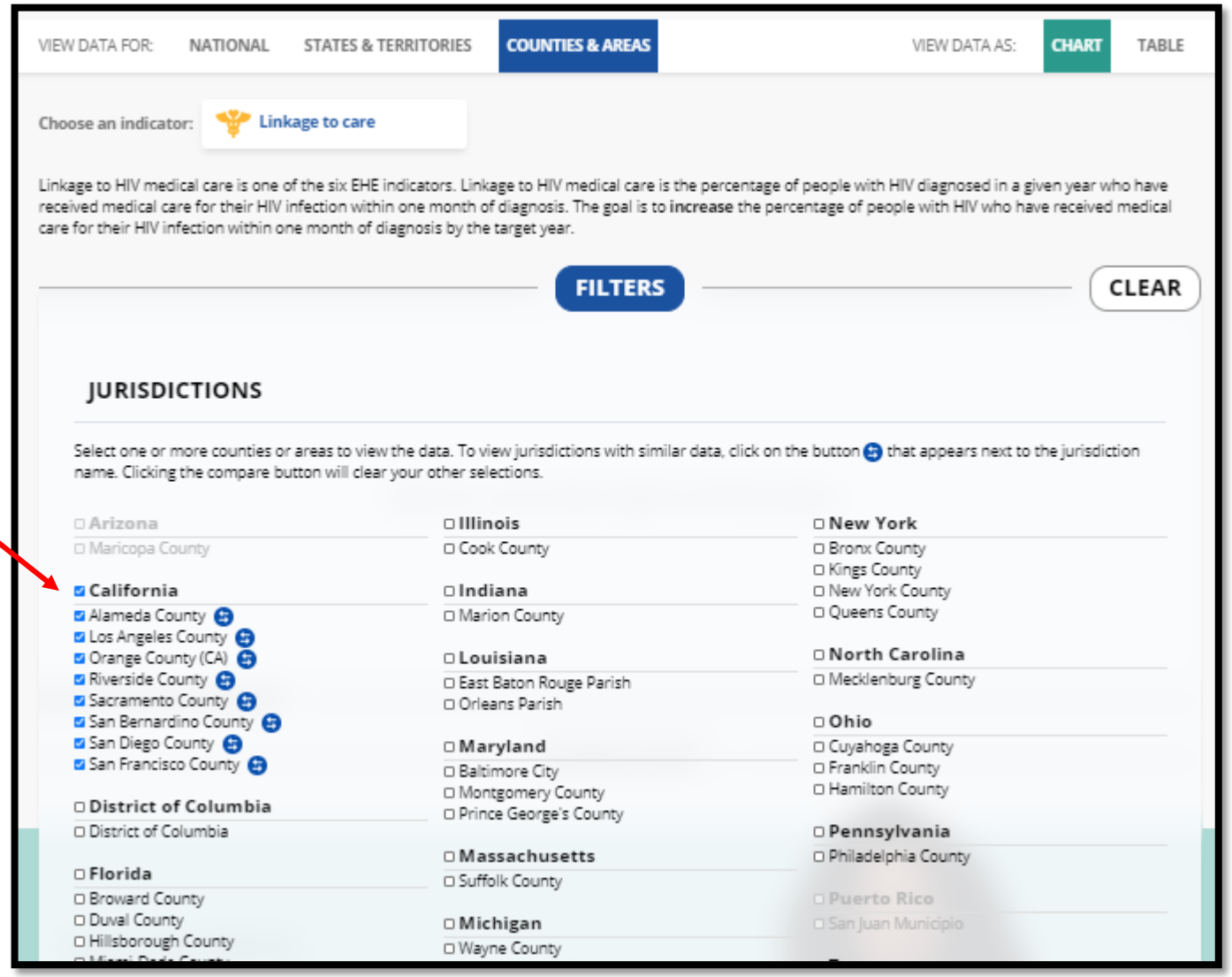


County/Area Data Filters

EHE priority counties/areas can be viewed on the same graph as well, whether they are in the same state or not.

By selecting the whole group (such as “California”), all counties within that group will be auto-selected for comparison.

Select “Filters” to see the graph.



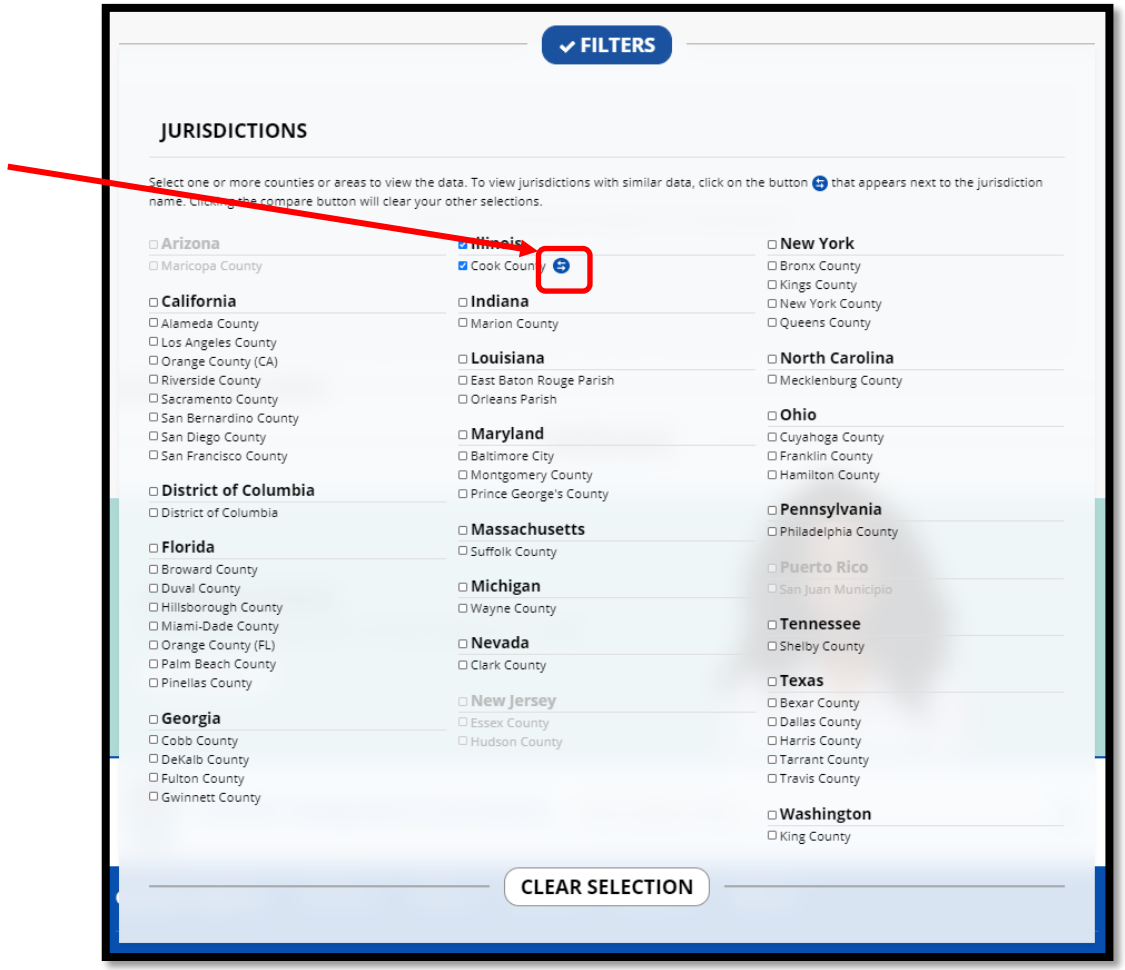
Similar Jurisdiction Functionality

The Similar Jurisdiction Functionality was designed based on stakeholder requests to easily identify and compare similar EHE jurisdictions.

The "Show Similar Jurisdiction" functionality identifies the three most similar EHE counties/areas based on a jurisdiction's EHE progress across all six indicators.

Similar jurisdictions may be different along some indicators but will not be significantly different along all of them.

These similar jurisdictions may be interested in communicating with and exploring similar strategies in order to better achieve EHE goals.



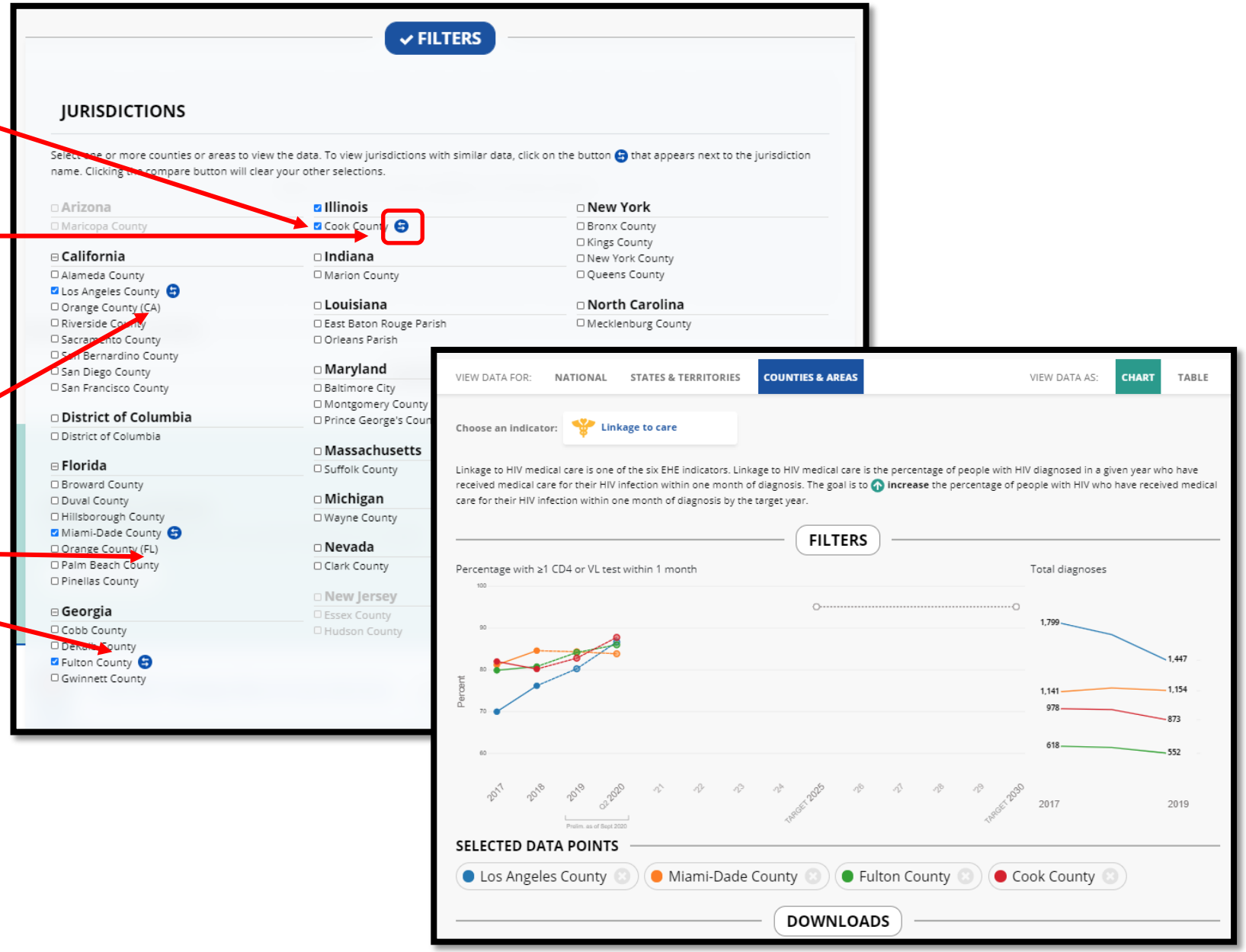
For more information on the technical methodologies behind this functionality, see the backup slides.

Similar Jurisdiction Functionality (Continued)

Select the checkbox of one county/area.

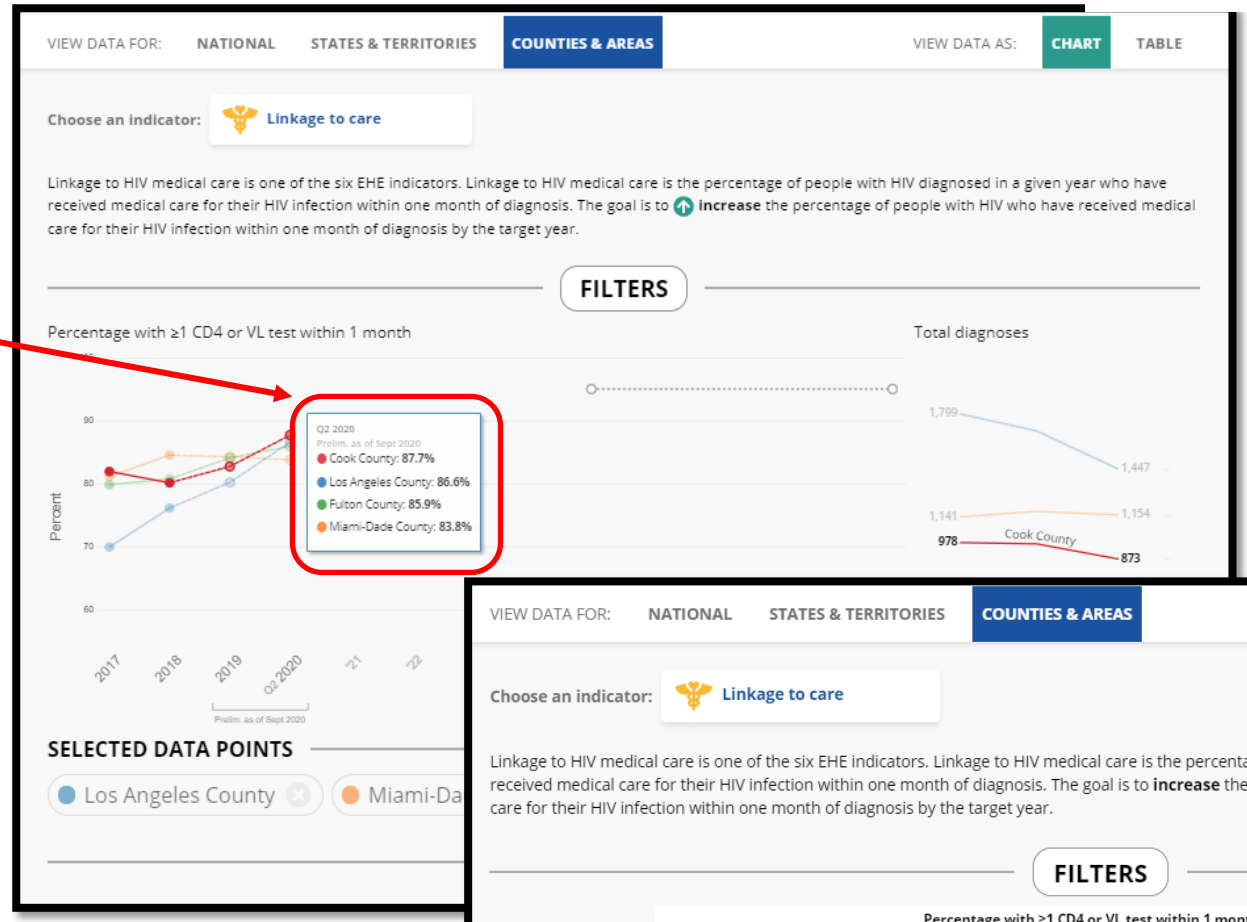
Then select the blue arrows button to the right of that county.

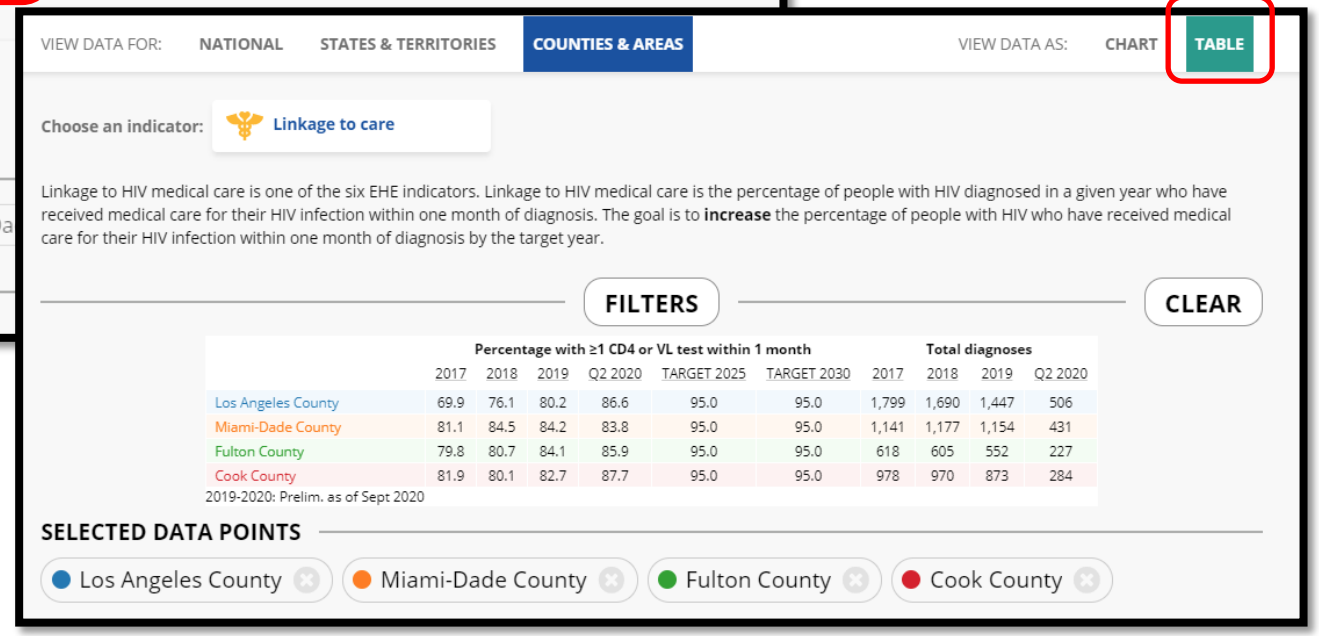
Three other counties/areas will auto-select based on similar EHE progress.



Tooltips

Tool tips will display data for all selected jurisdictions for that year. Only one year will show at a time.

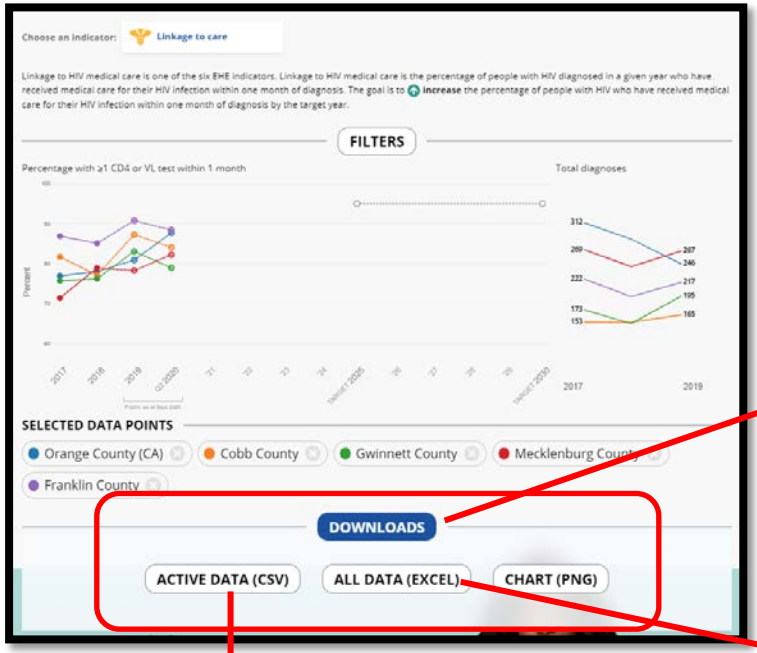


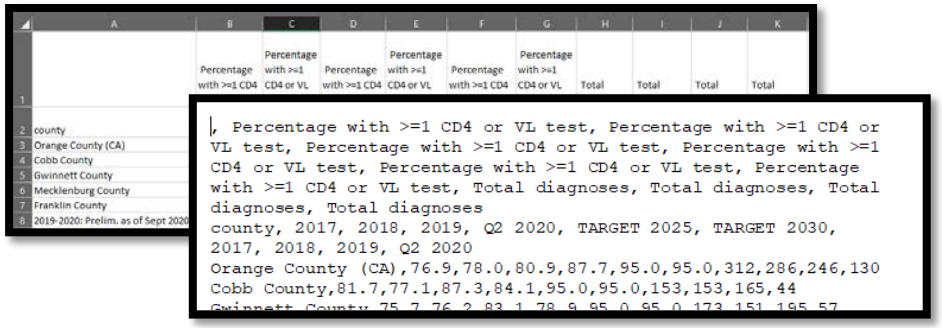


Data points for all years and all selected jurisdictions can be viewed at the same time by selecting the *table* view.

A tool-tip is also known as a hover-over, pop-up, or text box. This feature displays data when the mouse hovers over a data point.

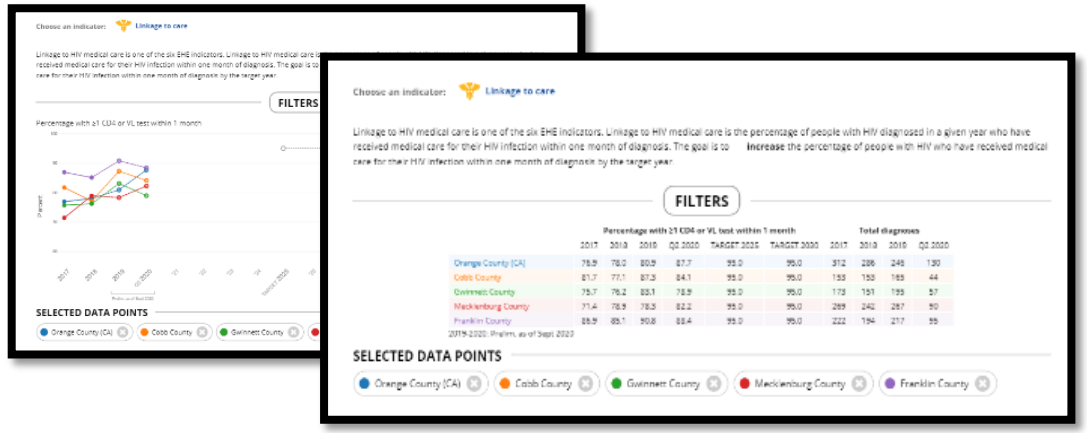
Downloads



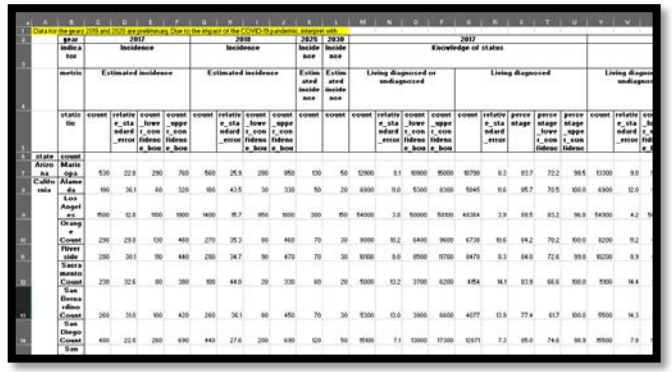


Active data will only download the data currently shown on the screen. It can be downloaded as a CSV (typically used by data scientists) or as an Excel document for easy-viewing.

Under the graph, select the *downloads* button.



An image of the graph and table can be downloaded to use in reports and presentations.



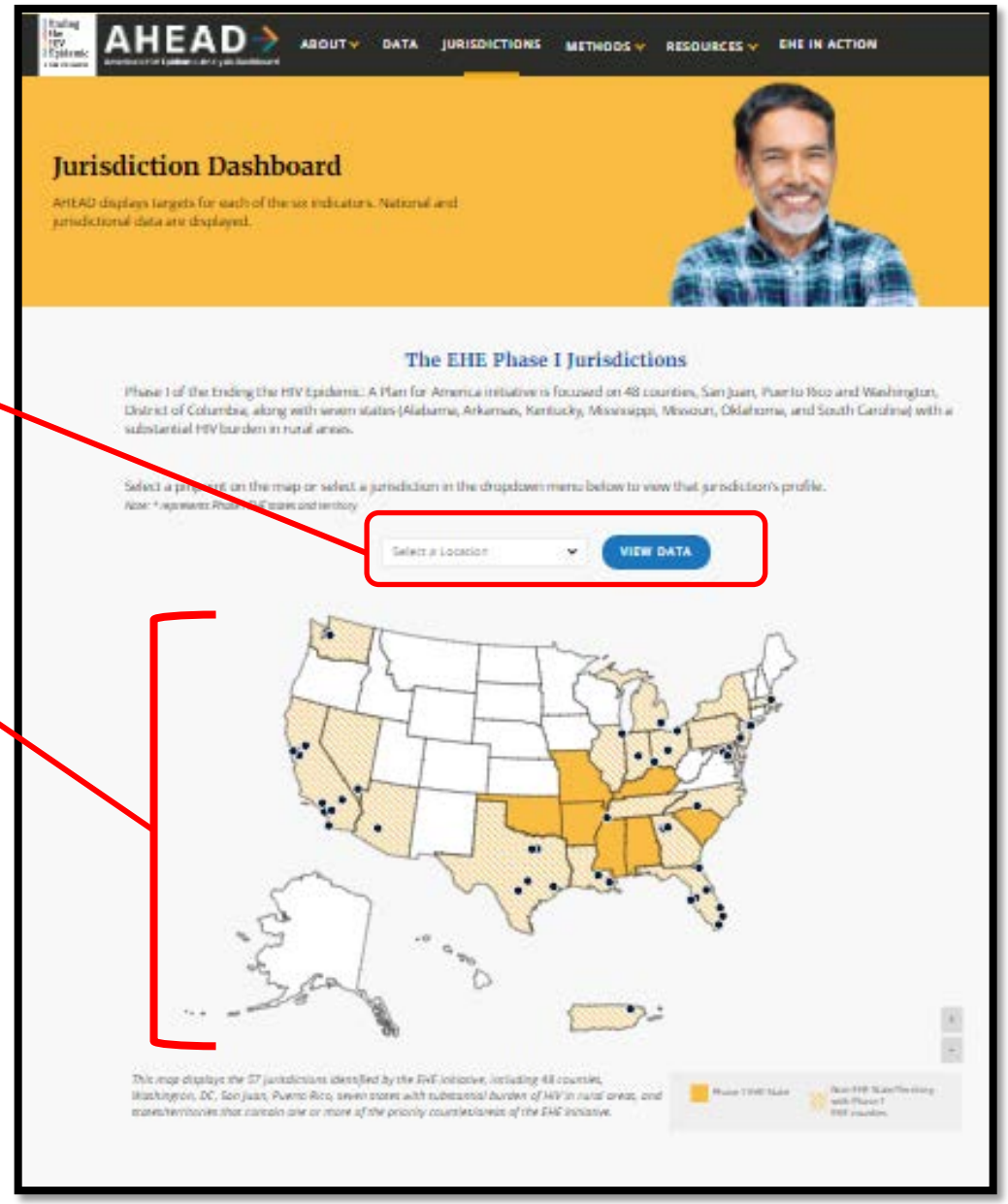
A formatted Excel document of all data available on AHEAD can be downloaded. This includes some data (such as confidence intervals) not displayed in the table view.

Jurisdiction Pages

An individual jurisdiction page can be viewed by:

Selecting from the drop-down and "View Data". Jurisdictions are organized alphabetically by state/territory name, then by county/area name within.

Selecting a state/territory or a pinpoint on the map. The map can be zoomed in to clearly see/select areas that are closely clustered geographically.



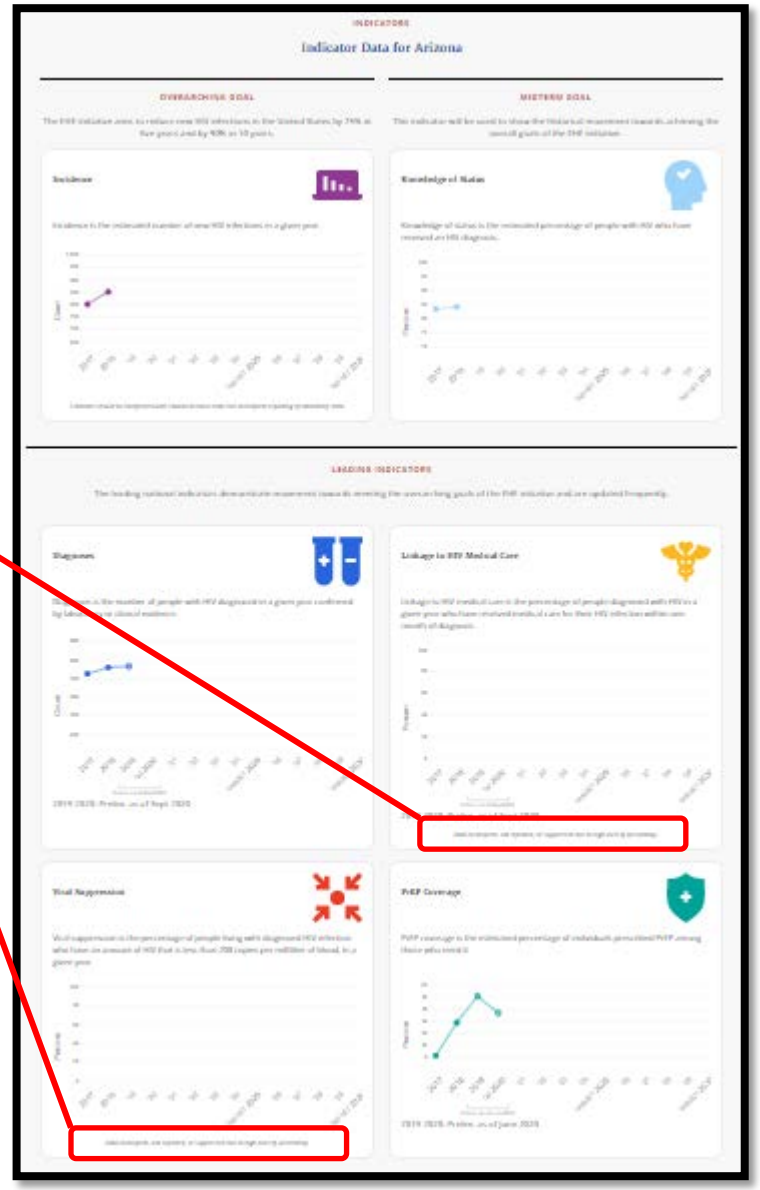
Jurisdiction Pages

All 50 U.S. states, 48 EHE counties, Puerto Rico, San Juan, and Washington D.C. are viewable.

Not all locations have complete data for all indicators. Some locations will have a footnote that states:

Data incomplete, not reported, or suppressed due to high level of uncertainty.

- Some states don't have complete laboratory data (at least 95% of lab results reported to surveillance programs and transmitted to CDC) or don't have laws requiring complete reporting.
- States that don't have enough data are not reported because of reliability concerns. (For instance, PrEP prescription data values <40 are not displayed).
- Areas with relative standard errors of 30-50% are displayed but should be interpreted with caution. Estimates with an RSE >50% are not down due to a high level of uncertainty.



We Welcome Your Questions & Feedback

Contact us!

EndHIVEpidemic@HHS.GOV

Similar Jurisdiction Functionality

Technical Methodologies

Featurization

A data frame consisting of important features that have similar variance and low correlation is constructed and rescaled in a way that will not attribute too much importance to any single feature. This is necessary because clustering algorithms typically will not rescale the data. The goal is to include no more than one feature per EHE indicator.

Aggregation

Step 1- Estimates and goals data are ignored for the purpose of this analysis. 2019 preliminary data, 2020 preliminary data, 2025 goal data, and 2030 goal data are dropped.

Step 2- Data is reduced by taking the mean of all time series segments. In other words, for each pair of 2017 and 2018 data points, the mean is used, and the original figures are dropped.

Note: Ignoring 2017 figures in favor of 2018 figures was considered, but ultimately decided against, as this introduced an unnecessarily large number of missing values.

Similar Jurisdiction Functionality

Technical Methodologies

Clustering Methodology

The goal is to show local public health officials which jurisdictions are like their own regarding EHE progress.

A *brute-force nearest-neighbors* approach is used to quickly and easily show each jurisdiction the top *k* most similar jurisdictions to their own. We chose *k* = 3 and ran the algorithm on the features data frame shown on the previous slide.

The distance metric for the clustering algorithm is the Euclidean distance. The clustering algorithm computes a Euclidean distance matrix of size N-by-N for N counties. The nearest neighbors to county A and the *k = 3* closest counties to A according to the distance matrix.

Similar Jurisdiction Functionality

Technical Methodologies

Transformation

A simple *log transform* is applied for quantity variables in order to make the distance between 100 and 1,000 appear the same as the distance between 1,000 and 10,000. This will transform the distribution of values from having an approximately log-normal appearance to an approximately normal appearance.

A *log odds ratio transform* is applied for percentage variables. It transforms variables from a domain of [0, 100] to a range of $(-\infty,\infty)$. The log odds ratio transform is as follows for a variable bounded between 0 and 100.

$$x' = \log\left(\frac{x}{100 - x}\right)$$

Missing Values

Mean-imputation is used on features to fill in missing values. A total of 10 values out of 250 total values were missing and then imputed.